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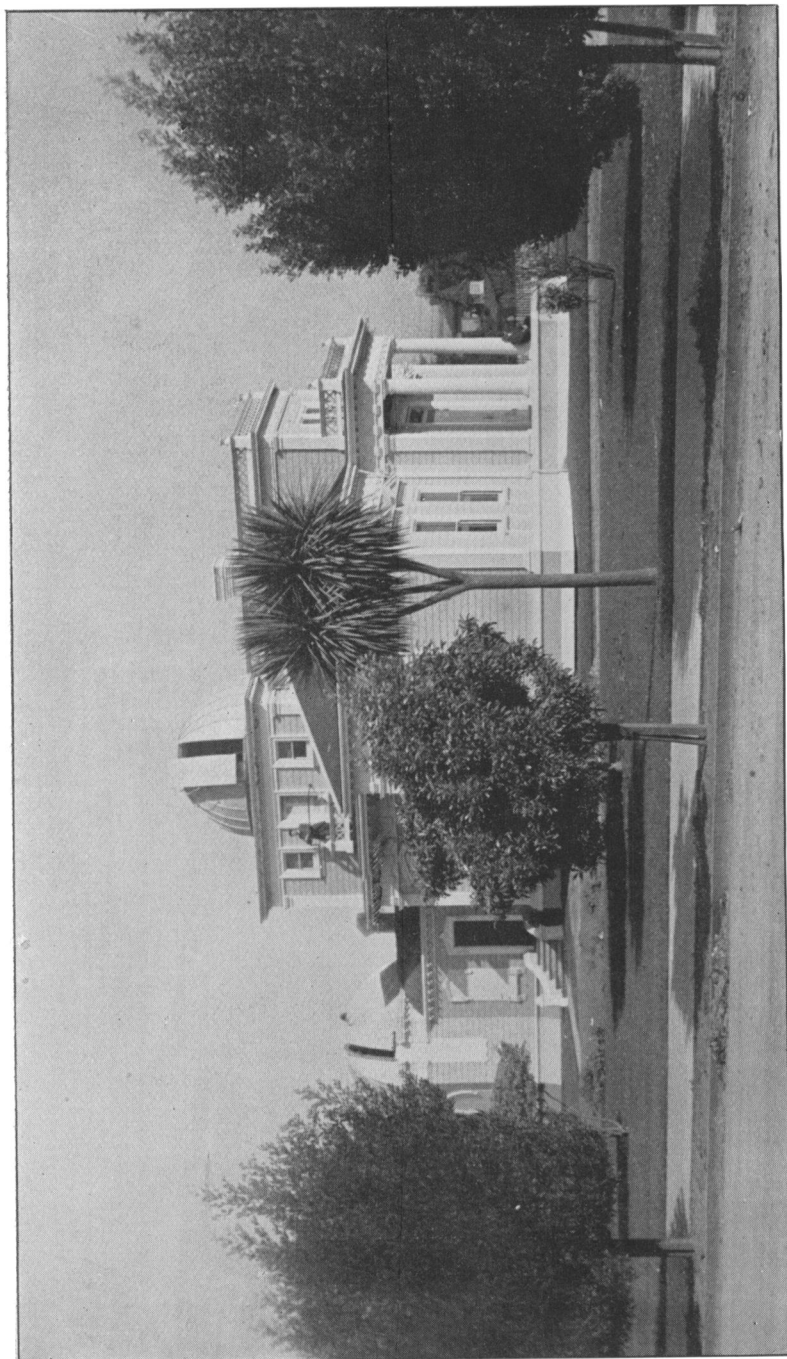
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THE CHABOT OBSERVATORY.

From a negative by F. R. Ziel.

and increased observers all over the world; will eclipse what is done at the present time. What SPENSER said with true prophetic inspiration, in the sixteenth century, can be repeated to-day:

“Yet all these were, when no man did them know,  
Yet have from wisest ages hidden been:  
And later times thinges more unknowne shall show.  
Why then should witlesse man so much misweene,  
That nothing is but that which he hath seen?  
What if within the Moone's fayre shining sphere,  
What if in every other starre unseene  
Of other worlds he happily should heare,  
He wonder would much more: yet such to some appeare.”

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## THE CHABOT OBSERVATORY.

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BY CHAS. BURCKHALTER.

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A prominent feature of the Oakland School Department is the CHABOT Observatory, the only Observatory of its kind in the world. It was founded by a public-spirited citizen of Oakland, the late ANTHONY CHABOT, Esq., and presented to the Board of Education in trust for the city of Oakland, to be used to educate the general public and the pupils of our public schools.

The original building was erected in 1883, under the direction of Hon. J. C. GILSON, who was Superintendent of Schools at the time, and Hon. WM. H. JORDAN, member of the Board of Education, and it was due to the influence of these gentlemen that Mr. CHABOT was induced to build and equip the Observatory, and the school children of Oakland will always owe them a debt of gratitude.

About one year ago the Observatory was almost entirely reconstructed, and bears no resemblance to the old building. (See cut.)

The former building consisted essentially of a transit room, reception room and the equatorial room (14 feet in diameter) at the top of the tower, and it was reached by 4 flights of zigzag stairs of 52 steps, the entrance being through a trap-door in the floor—a most awkward arrangement. Of the old building, the

transit room remains as before, the reception room, 11 x 15, is now occupied as an office and library, and the remainder was torn away.

Upon the site of the old tower the new equatorial room, 20 x 20, has been erected, 15 feet lower than the former one, and, while not only larger and more accessible, the reduced elevation has cut out about 200 arc lights scattered for miles around from Berkeley to Alameda. That these lights are a most serious evil from an astronomical point of view, it is only necessary to mention the fact that Professor BARNARD, at the LICK Observatory, is compelled to close his window blinds to shut out the electric lights of San José, distant 13 miles in a straight line, when engaged upon faint comet work.

On the first floor, in addition to the office and transit room there is a reception room 20 x 20, the lecture room 20 x 30, vestibule 6 x 10, hat room, battery room, etc., while in the second story, besides the equatorial room there is a bed room, upper hall, and an exceedingly useful little workshop, where alterations and repairs and special apparatus are made.

The new addition was paid for by the accumulated interest and a small amount of the principal of the \$10,000 bequest of the late ANTHONY CHABOT. In about two years the deficit in the principal will be made good by the interest, and will, no doubt, be as zealously guarded by future Boards as by the present Board and its predecessors. As it stands, the Observatory has cost between \$25,000 and \$30,000, but this does not represent the time and labor of the gentlemen to whom was given the execution of the plans, which, if it had been paid for, would have greatly increased the cost.

The equipment of the Observatory is as follows :

An 8-inch equatorial telescope, with micrometer and spectro-scope, by ALVAN CLARK & SONS. The chronograph and the  $4\frac{1}{8}$ -inch transit were made by FAUTH & Co., Washington. The mean-time clock, also made by FAUTH & Co., has a gravity escapement, with 60-pound pendulum, and break-circuit arrangement. The sidereal clock was made by E. HOWARD & Co. The sidereal break-circuit chronometer was made by the Messrs. NEGUS of New York.

Correct time is furnished to the city twice daily, the mean-time clock automatically breaking an electrical circuit by which the bells in all the engine houses and the City Hall bell are rung

every day at precisely 12 o'clock noon (3 strokes) and 9 P. M. (9 strokes), Pacific Standard time; the *first* stroke indicating 12 noon and 9 P. M.

There is also a complete set of meteorological instruments, mostly from GREEN of New York and RICHARD BROTHERS of Paris, and over thirty-five observations are made and recorded daily. Complete reports are sent to the Weather Bureau every month—the Observatory being a regular volunteer station—and an abstract is furnished, also monthly, to the City Board of Health for use in its report. A seismograph is kept in constant readiness to record the direction and intensity of earthquake shocks.

The lecture room is furnished with folding opera chairs, with tablet-rests for taking notes, and nearly everything necessary for technical instruction is provided. There are two lanterns, one with an arc light for projecting spectra, the other is a first-class double stereopticon, for projecting ordinary lantern slides. The lights in this lantern are powerful spiral filament incandescent lamps, and give plenty of light for a picture 12 x 12 feet—the size shown.

The projecting lamps, hand lamps near the lantern, front hall lamps, the chandeliers and platform lights are all under the control of the teacher or lecturer, by a switch on the platform, constructed in the Observatory workshop. The switch has but a single lever, and any one or two groups of lamps can be burned or dissolved at will, and the lantern lamps can also be controlled at the lantern if the teacher is without an assistant.

The equatorial room is lighted by 6 incandescent lamps that are so arranged that they can be made to burn singly, or with any degree of brilliancy, from being barely visible in the dark to full brightness. Astronomers will appreciate this feature. There are about 50 incandescent lamps in the building, the current being on from dusk until 12 o'clock; at other times gas must be used.

The Observatory is situated in the middle of Lafayette Square, which is bounded by Tenth, Eleventh, Grove and Jefferson Streets. The use of the square was donated by the city. Its exact geographical position is Lat.  $37^{\circ} 48' 5''$  north; Long.  $122^{\circ} 16' 39.3''$  west from Greenwich, or in time  $8^h 9^m 6.62^s$  west from Greenwich;  $3^h 0^m 54.58^s$  west from Washington, the longitude having been determined telegraphically by Professor GEORGE DAVIDSON of the United States Coast and Geodetic Survey, and Assistant BURCKHALTER, in connection with Messrs. MARR and

SINCLAIR, United States Coast and Geodetic Survey, the latter gentlemen exchanging signals from the DAVIDSON Observatory, San Francisco.

The rules governing the Observatory are of the simplest character. Monday and Tuesday evenings of each week are reserved for the High and Grammar schools during school terms, and Friday evening for time observations and other work, and on all other evenings excepting Sunday, the time is devoted to the instruction of visitors and private schools. Visitors are not admitted without a visitor's card from the Director's office. This rule is necessary in order to regulate the number, and to obtain a card it is only necessary to apply at the office of the Superintendent of Schools, Mr. J. W. MCCLYMONDS, who is also the Director of the Observatory.

Until the Observatory was rebuilt the attendance gradually increased each year, from 1644 in 1886-7 to 2240 in 1891-2, but since November, 1892, when the new building was opened, it has been impossible to keep anything like a correct register. For many nights when the lecture room alone is used no account is kept, but it is well within the limits to say there are fully 5000 visitors a year.

To determine the effect of the electric street lights, experiments were made in stellar photography during the past winter and very encouraging results obtained. At my request, Mr. JOHN A. BRITTON, the Secretary of the Electric Light Co., altered all the lamps visible from the Observatory, so that the cone of shadow thrown by the arms of the lamps fell upon the equatorial dome, and the change for the better was very great. One lamp only about 300 feet from the Observatory, arranged as above, has no more evil effect visually, than a naked gaslight at the same distance. The BAUSCH & LOMB OPTICAL CO. of Rochester, N. Y., are at work upon a 4-inch (doublet) lens to carry on this photographic work during the coming winter.

CHABOT OBSERVATORY, March, 1894.